Montana deer and elk hunting population:

Hunter retention, recruitment, and population change

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Questions

- What is the trend in the deer and elk hunter population in Montana?
 - What factors influence participation?



Hunter population

Hunters

License purchasers in a given year

Hunter population

Hunters

Participation

License purchasers in a given year

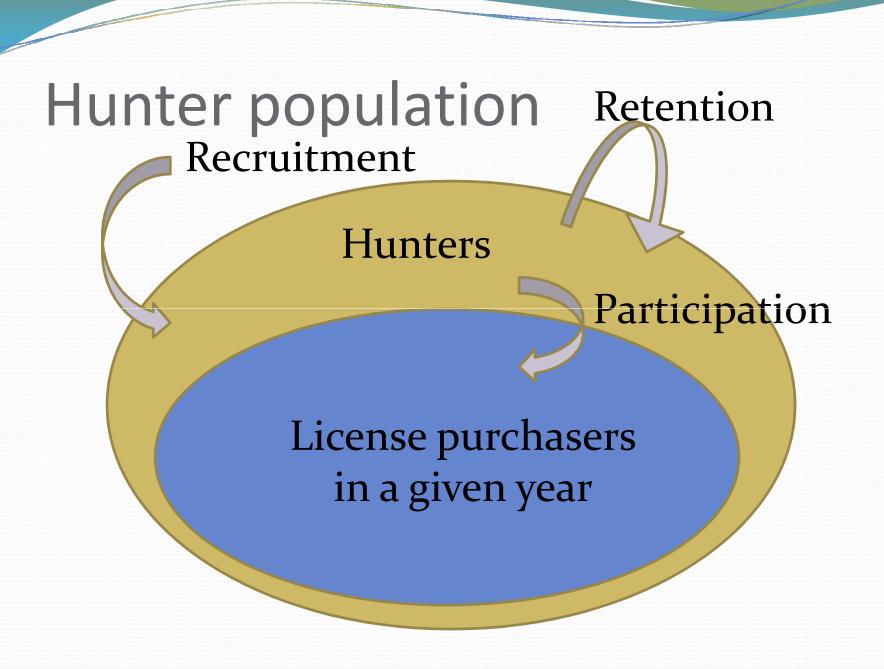


Recruitment

Hunters

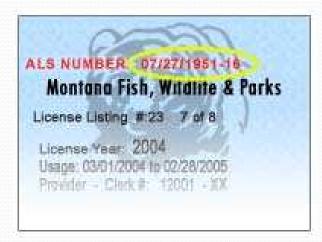
Participation

License purchasers in a given year



Methods

- Automated Licensing System database
 - Accurate tracking of purchases through time
 - Available in 2002
 - >490,000 deer and elk hunters



Mark-recapture of hunters

- License purchases are "captures"
- Build a history of purchases
- Analyze as mark-recapture data



Application to hunters

- Survival hunter retention
- Detection probability of purchasing a license
- Recruitment hunter recruitment

Are there generational differences?

- Birth Cohorts
 - Traditionalists (born 1900 1945)
 - Baby Boomers (born 1946 1964)
 - Generation Xers (born 1965 1980)
 - Millennials (born 1981 2000)



Are there demographic differences?

- Gender
- Age
- Residency



Are there affects of licenses?

- Opportunity
 - Number of antlerless licenses sold
- Price
 - Resident and non-resident

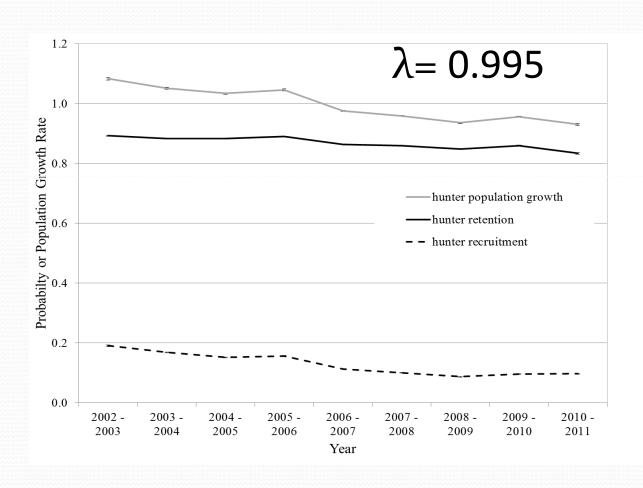
- Recruitment
 - Residents < Non-residents (β =-1.121, SE=0.15)
 - Males < Females (β =-0.62, SE=0.02)
 - Older < Younger ($\beta = -0.052$, SE=0.001)
 - Resident & non-resident license price (negative)

- Retention
 - Residents > Non-residents (β = 0.29, SE = 0.14)
 - Males > Females (β = 0.84, SE = 0.02)
 - Older < Younger ($\beta = -0.0015 \text{ SE} = 0.0006$)
 - Resident & non-resident license price (negative)

- Birth Cohorts
 - Retention
 - Baby Boomer > GenXers = Traditionalists > Millennials
 - Recruitment
 - Baby Boomer > Traditionalists > GenXers = Millennials

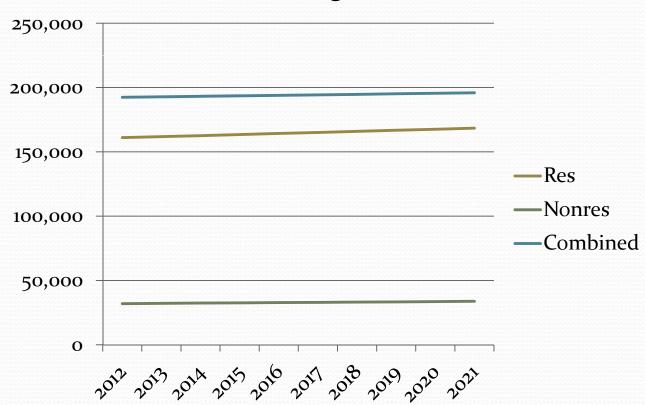
- Price Retention
 - Residents \$16 -> \$20
 - 0.94 -> 0.92
 - Non-residents \$578 -> \$794
 - 0.74 -> 0.53

Growth Rate



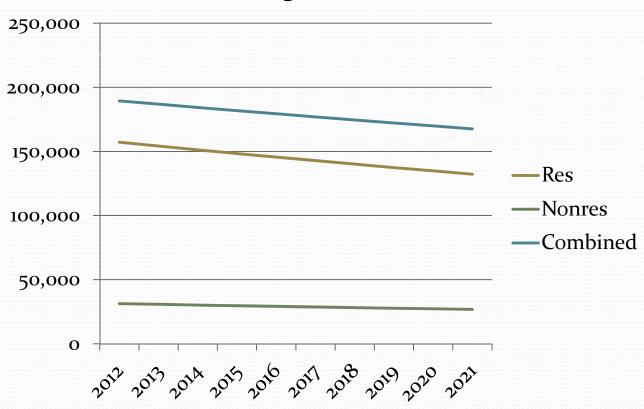
Growth Projections

Growth predictions: 10-year average annual growth



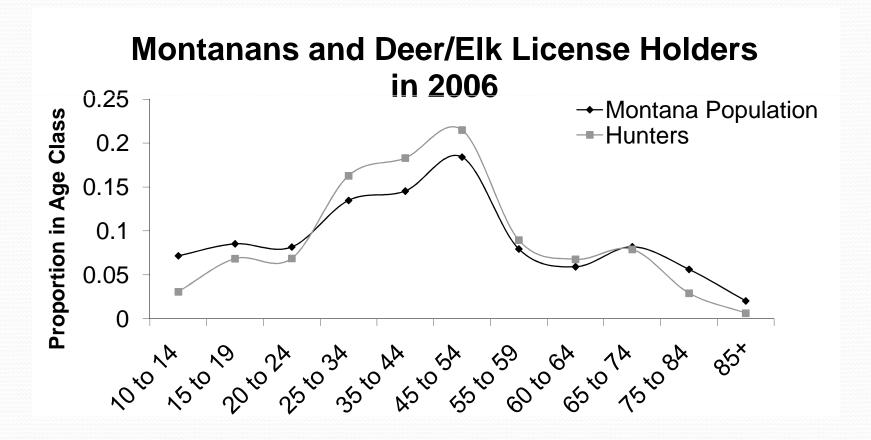
Growth Projections

Growth predictions: 3-year average annual growth



- Hunter retention is more influential on change in hunter numbers than recruitment
 - 2011 example: retention = 0.83 and recruitment = 0.096
 - To remain stable, deer and elk hunter population would require:
 - 9% increase in retention, or
 - 200% increase in recruitment

Changing societal values? Or just demographics?



- Baby-boomers
 - Concern about replacement
- Non-residents
 - Target new non-resident hunters

- Hope for the future
 - Current birth pulse
 - Targeted recruitment and retention

Questions?

- Acknowledgments:
 - Funding from license fees and Federal Aid in Wildlife Restoration



